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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,086	05/31/2001	Ari P. Heikkinen	456-010392-US(PAR)	9314

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FAIRFIELD, CT 06824

EXAMINER

VO, HUYEN X

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 04/20/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

**Application No.**

09/871,086

**Applicant(s)**

HEIKKINEN, ARI P.

**Examiner**

Huyen Vo

**Art Unit**

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2001.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 8-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Kleijn et al. (US Patent No. 6223151).

1. Regarding claims 1 and 8, Kleijn et al. disclose a method of encoding speech and an apparatus for generating a modified signal suitable for use with an speech encoder/decoder comprising the steps of:

formulating a speech signal from utterances spoken by a speaker (input speech 120 is in the form of discrete samples, which are processed by elements 130 and 140 of figure 1);

determining an estimate of periodicity from the formulated signal (col. 4, ln. 66 to col. 5, ln. 5);

modifying the formulated signal using the periodicity estimate such that the periodicity is improved (col. 7, ln. 1 to col. 8, ln. 43 or referring to elements 190, 200, and 210 of figure 1); and

encoding the modified signal in a speech encoder (Speech Coder 110 of fig. 1).

2. Regarding claim 12, Kleijn et al. disclose a mobile device (col. 1, ln. 14-17) comprising:

a speech coder (element 110 of figure 1);

means for formulating a speech signal from utterances spoken by a speaker (input speech 120 is in the form of discrete samples, which are processed by elements 130 and 140 of figure 1);

means for determining an estimate of periodicity from the formulated signal (col. 4, ln. 66 to col. 5, ln. 5);

means for modifying the formulated signal using the periodicity estimate such that the periodicity is improved (col. 7, ln. 1 to col. 8, ln. 43 or referring to elements 190, 200, and 210 of figure 1); and

means for encoding the modified signal in the speech coder (Speech Coder 110 of figure 1).

3. Regarding claim 2, Kleijn et al. further disclose that the formulated speech signal is a digitized signal such as a residual signal produced from a coding algorithm such as Linear Predictive Coding (LPC) or the actual speech signal itself (input speech 120 is inherently in the form of discrete samples required for processing by processors 130 and 140 of figure 1).

Art Unit: 2655

4. Regarding claims 9 and 13, Kleijn et al. further disclose that the formulating means includes software operating with a signal processor that is capable of generating a residual signal from a speech signal (col. 4, ln. 51-65, the residual processor 160 inherently includes software programs for generating linear-prediction residual).

5. Regarding claims 10 and 14, Kleijn et al. further disclose a memory comprising a software operating with a signal processor for providing means for transforming (elements 130 and 140 of figure 1), estimating (col. 4, ln. 66 to col. 5, ln. 5, processor inherently includes memory for storing software instructions), and modifying the speech signal (processors 190, 200, and 210 of figure 1).

6. Regarding claim 11, Kleijn et al. further disclose that the apparatus is integrated into a mobile device (col. 1, ln. 7-20).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-5, 7, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleijn et al. (US Patent No. 6223151) in view of Kleijn (US Patent No. 5517595).

7. Regarding claim 3, Kleijn et al. fail to disclose that determining an estimate of periodicity step comprises obtaining a normalized pitch cycle by autocorrelation. However, Kleijn teaches that determining an estimate of periodicity step comprises obtaining a normalized pitch cycle by autocorrelation (col. 7, ln. 41-50). The advantage of using the teaching of Kleijn in Kleijn et al. is to select the pitch period proper for a certain point in time.

Since Kleijn et al. and Kleijn are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Kleijn in order to select the pitch period proper for a certain point in time.

8. Regarding claim 4, Kleijn et al. further disclose that the modifying step includes normalizing the pitch by shifting the time domain discrete values of the residual signal to conform to the normalized pitch cycle (col. 7, ln. 59-67).

9. Regarding claim 5, Kleijn et al. further disclose that the modifying step further comprises the speech signal being upsampled by interpolation such that suitable

Art Unit: 2655

discrete values of the upsampled signal are shifted to conform to the average pitch cycle (Interpolator 140 of figure 1).

10. Regarding claim 7, Kleijn et al. fail to disclose that the modified signal is down sampled prior to encoding in the speech coder. However, Kleijn further teaches that the modified signal is down sampled prior to encoding in the speech coder (col. 11, ln. 25-35). The advantage of using the teaching of Kleijn in Kleijn et al. is to lower bandwidth for the gain below the extraction frequency of the prototype waveform to minimize coding errors.

Since Kleijn et al. and Kleijn are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Kleijn in order to lower bandwidth for the gain below the extraction frequency of the prototype waveform to minimize coding errors.

11. Regarding claim 15, Kleijn et al. disclose a network element (col. 1, ln.7-17) comprising:

means for formulating a speech signal from utterances spoken by a speaker (input speech 120 is in the form of discrete samples, which are processed by elements 130 and 140 of figure 1);

means for determining an estimate of periodicity from the formulated signal (col. 4, ln. 66 to col. 5, ln. 5);

means for modifying the formulated signal using the periodicity estimate such that the periodicity is improved (col. 7, ln. 1 to col. 8, ln. 43 or referring to elements 190, 200, and 210 of figure 1); and

means for encoding speech signals using the modified signal (Speech Coder 110 of figure 1).

Kleijn et al. fail to disclose means for decoding speech signals using the modified signal. However, Kleijn teaches means for decoding speech signals using the modified signal (figure 9 or col. 3, ln. 44-45). The advantage of using the teaching of Kleijn in Kleijn et al. is to enable the network to reconstruct the original signal for users.

Since Kleijn et al. and Kleijn are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Kleijn in order to enable the network to reconstruct the original signal for users.

12. Regarding claim 16, Kleijn et al. further disclose that a network element integrated into a radio base station functioning within a wireless telecommunication network (col. 1, ln. 7-17).

13. Regarding claim 17, Kleijn et al. further disclose that the formulating means includes software operating with a signal processor that is capable of generating a residual signal from a speech signal (col. 4, ln. 51-65, the residual processor 160 inherently includes software programs for generating linear-prediction residual).



14. Regarding claim 18, Kleijn et al. further disclose a memory comprising a software operating with a signal processor for providing means for transforming (elements 130 and 140 of figure 1), estimating (col. 4, ln. 66 to col. 5, ln. 5, processor inherently includes memory for storing software instructions), and modifying the speech signal (processors 190, 200, and 210 of figure 1).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kleijn et al. (US Patent No. 6223151) in view of Donovan et al. (US Patent No. 6266637).

15. Regarding claim 6, Kleijn et al. fail to disclose that a pitch scaling algorithm such as Time Domain Pitch Synchronous Overlap-Add (TD-PSOLA) is used to normalize the pitch cycle lengths in an analysis frame. However, Donovan et al. teach that a pitch scaling algorithm such as Time Domain Pitch Synchronous Overlap-Add (TD-PSOLA) is used to normalize the pitch cycle lengths in an analysis frame (col. 4, ln. 1-25). The advantage of using the teaching of Donovan et al. in Kleijn et al. is to minimize signal degradation so to preserve characteristics of the original signal.

Since Kleijn et al. and Donovan et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Donovan et al. in order to minimize signal degradation so to preserve characteristics of the original signal.

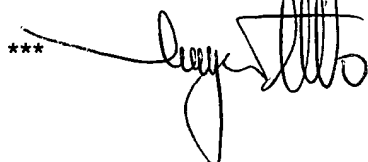
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665. The examiner can normally be reached on M-F, 9-5:30.

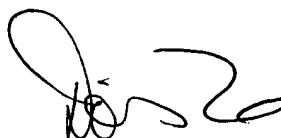
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Huyen X. Vo

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April 9, 2004



**DORIS H. TO**  
**SUPERVISORY PATENT EXAMINER**  
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